

**Remarks*****General:***

Claims 1-15 were pending in the application before this amendment. Claims 1-15 stand rejected in the present office action. Claims 3, 14, and 15 are canceled with the proviso that the subject matter defined therein may be later claimed without prejudice in a continuation or divisional application. Claims 1 and 4-6 are amended. Claims 1, 2, and 4-13 are pending in the application after this amendment.

Claim 1 has been amended to combine with it the feature of previous claim 3. Consequential amendments have been made to claims 4-6. No new matter has been added by these amendments.

***Drawings:***

The drawings were objected to as not showing the features specified in claims 14 and 15. Claims 14 and 15 have been canceled, and these objections no longer apply.

***Claim objections:***

Claims 14 and 15 were objected to. Claims 14 and 15 have been canceled, and these objections no longer apply.

***35 U.S.C. § 112:***

Claims 14 and 15 stand rejected as indefinite. Claims 14 and 15 have been canceled, and these rejections no longer apply.

***35 U.S.C. § 102:***

Claims 1-5 stand rejected as anticipated by Maki et al. "Recent Advances in Pulmonary Imaging." Maki, as its title implies, is a review of various methods of imaging in use or contemplation, many of them "in the early stages of investigation," p. 1393, left column, last

line. A reasonable reader would expect Maki to list various approaches to imaging a particular situation, many of them alternative or mutually exclusive. Thus, under “Emphysema” at pages 1392-3, Maki lists techniques including: “newly evolving pulmonary imaging methods” to measure V/Q abnormalities, page 1392, right column, last 5 lines; “pulmonary ventilation imaging with hyperpolarized  $^3\text{He}$  gas” to image gas distribution, p. 1393, left column, lines 1-4; and four different MRI and CT techniques for measuring pulmonary perfusion, p. 1393, left column, second paragraph. These are listed as independent proposed approaches that “may” be useful for assessing emphysema. Maki does not disclose or suggest combining these techniques into a single process as now claimed in claim 1.

For all of the above reasons, it is therefore believed that the combination of features now recited in claim 1 is not only new but also non-obvious over Maki. Claims 2, 4, and 5 are dependent from claim 1 and, without prejudice to their individual merits, are believed to be new and non-obvious over Maki for the same reasons as claim 1.

Claims 1-3 stand rejected as anticipated by U.S. Patent No. 6,370,415 (Weiler et al.) The examiner contends that Weiler discloses “collecting 3D MR image data and quantitatively calculating V/Q and perfusion therefrom (col. 5 and col. 8 lines 5-57).” At col. 5, lines 52-54, Weiler in fact says “the local V'/Q ratio can be calculated; the addition of local ventilation then allows calculation of regional perfusion.” At col. 8, lines 42-43, Weiler does say that “as also mentioned above,  $^3\text{He}$  [MR] imaging may be combined with perfusion imaging using a second imaging agent administered into the vasculature” but this does not appear to be correct. At col. 3, lines 20-33, Weiler mentions administering a second MR agent into the subject’s vasculature (the two passages are further linked because  $^{19}\text{F}$  is mentioned as an agent in both places) but gives no suggestion that this is perfusion imaging.

When the cross-referenced passages from Weiler are read as a whole, it is not clear to a reader of ordinary skill what Weiler is proposing. Although at col. 3, line 20 Weiler describes the use of a vascular second imaging agent as a “preferred embodiment,” at col. 8, lines 48-57, Weiler contrasts that embodiment unfavorably with “the method of [Weiler’s] invention.” Weiler explains that the “perfusion data” obtained from imaging with the vascular second imaging agent does not actually measure perfusion, but only blood flow, in contrast to Weiler’s own process of deriving Q from V'/Q and V. Thus, there is no clear teaching or suggestion in

Weiler of a process that combines V/Q imaging with Q imaging, as now claimed in Applicants' claim 1. The clear teaching of Weiler to a reasonable reader is not to combine V/Q imaging with blood flow imaging, but instead to do what Weiler describes as "the invention," that is to say, measure V/Q and V, and calculate Q.

For all of the above reasons, it is therefore believed that the combination of features now recited in claim 1 is not only new but also non-obvious over Weiler. Claim 2 is dependent from claim 1 and, without prejudice to its individual merits, is deemed to be new and non-obvious over Weiler for the same reasons as claim 1.

**35 U.S.C. § 103:**

Claims 4 and 5 stand rejected as obvious over Weiler. Claims 6-13 stand rejected as obvious over Weiler or Maki in view of U.S. Patent No. 5,974,165 (Giger). Claims 5-13 are dependent from claim 1, and the rejections of claims 4-13 appear to be predicated on the Examiner's rejection of original claim 1. Without prejudice to their individual merits, claims 4-13 are deemed non-obvious over the cited references for the same reasons as claim 1.

Additionally, regarding claims 4 and 5, the examiner argues that it would have been obvious to substitute a gadolinium-based imaging agent or arterial spin-tagging for the second imaging agent of Weiler. It is respectfully submitted that would not have been obvious because, as discussed above, Weiler teaches away from perfusion imaging with the second imaging agent, regardless of composition.

Further, regarding claim 8, the examiner argues that Giger teaches techniques for co-registration of functional and morphological images. However, there is no teaching in Giger of choosing the specific input data-sets (V/Q and Q) recited in claim 8 or deriving the specific output data-set (V) recited in claim 8. It is respectfully submitted, therefore, that the claimed choices would not have been obvious because, as discussed above, Weiler teaches away from attempting to image Q at all. Thus, Weiler fails to provide, or even suggest, those input data-sets.

In sum, for the foregoing reasons, it is believed that the present invention, as claimed at least in claims 4, 5, and 8, is new and non-obvious over the cited references.

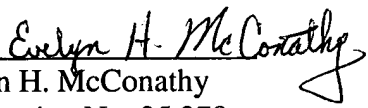
***Conclusion:***

In view of the foregoing, reconsideration of the Examiner's rejections and allowance of all of claims 1, 2, and 4-13 as presented in this response are earnestly solicited.

If the Examiner believes that direct communication with Applicants' representative will help advance this application, the Examiner is invited to contact the undersigned.

Respectfully submitted,

Dated: February 2, 2005

By:   
Evelyn H. McConathy  
Registration No. 35,279  
DRINKER BIDDLE & REATH LLP  
One Logan Square  
18<sup>th</sup> & Cherry Streets  
Philadelphia, PA 19103-6996  
Tel: (215) 988-3361  
Fax: (215) 988-2757

Attorney for Applicants